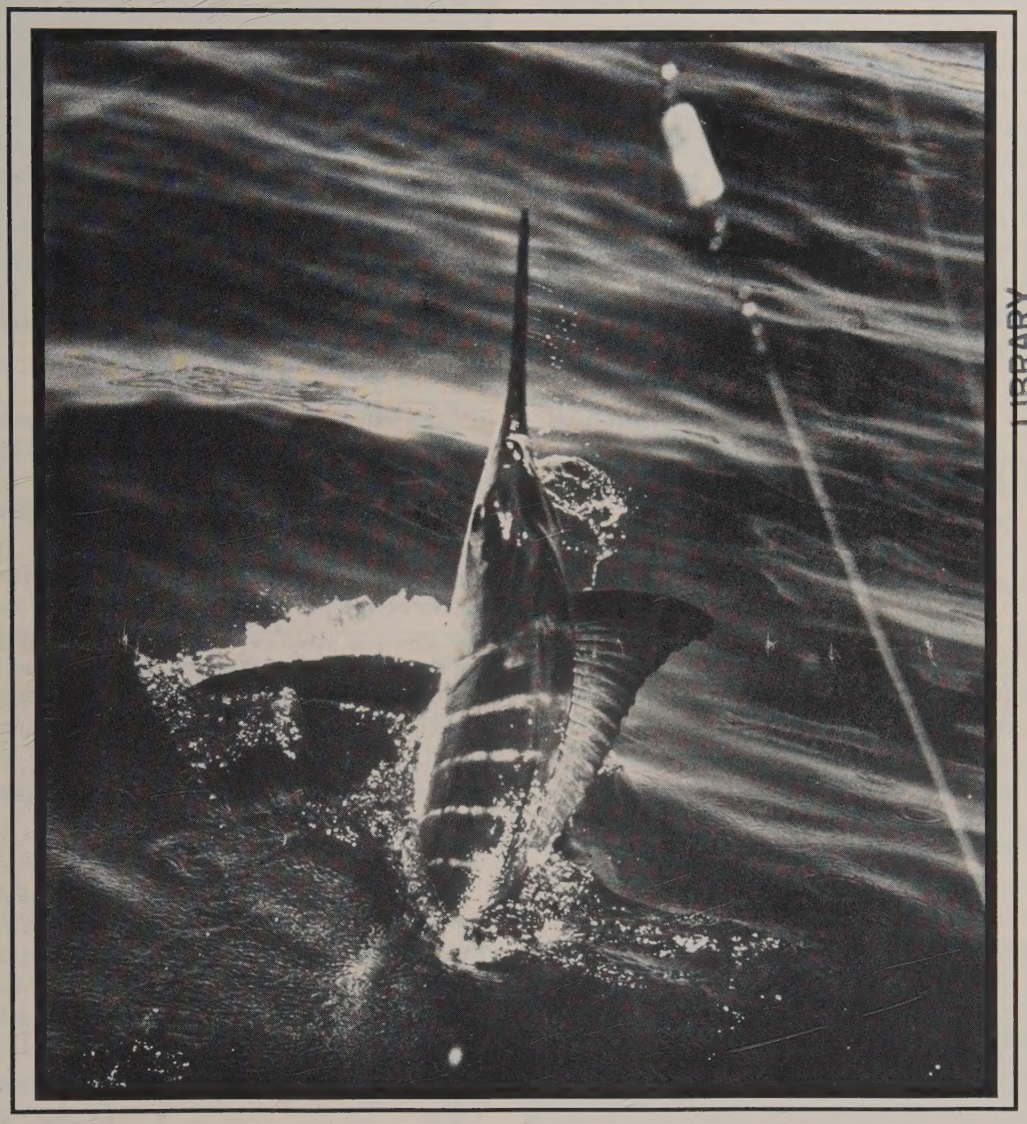
The Southwest Fisheries Science Center's

1998 Billfish Newsletter



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Results of Cooperation Programs

- Trends in 1996 and 1997 Billfish angler catch rates
- 1997 Billfish tagging and recoveries
- The Billfish Foundation and AFTCO

Commercial Billfish Landings

International Fishery Monitoring Indicated

New Tag Design

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
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INTRODUCTION

This *Billfish Newsletter* is an annual publication that describes two of the primary components of the Billfish Research Program at the Southwest Fisheries Science Center (SWFSC). The goal of this Program is to provide information for the conservation and rational management of billfish resources in the Pacific and Indian oceans. The *International Billfish Angling Survey* monitors changes in recreational angling catch and effort through a postcard survey while the *Cooperative Billfish Tagging Program* provides information on the distribution, migratory patterns and growth rates of billfish from tag recoveries. Both investigations rely on continued cooperation from billfish anglers, sport fishing clubs, commercial fishers and agencies affiliated with the SWFSC. Results of the *Angling Survey* for 1996 and 1997 and a summary of billfish tagged and recaptured in 1997 are included in this issue.

INTERNATIONAL BILLFISH ANGLER SURVEYS for 1996 and 1997

The *International Billfish Angler Survey* began in 1969 to provide survey information on recreational angler's billfish catch and fishing effort. The information developed from this Survey is used to measure trends in angler catch rates in specific areas in the Pacific and Indian oceans. Trends in angler catch rates, or average number of billfish caught for an angler's day of fishing, are important in understanding the impact of fisheries on billfish resources.

TAGGING PRIORITIES

Unfortunately the cost of Program supplies has exceeded available funds. Consequently, we are channeling our tagging efforts in the following priorities:

Southern California	Striped Marlin
	Broadbill Swordfish
Hawaii	Blue Marlin
	Striped Marlin
	Black Marlin
	Broadbill Swordfish
Mexico	Blue Marlin
	Black Marlin
Central America	All billfish
Indian Ocean	All billfish

SURVEY RESPONSE

Your response to the *Billfish Angler Survey* is needed to better determine the trend of angler catch rates and provide an index of the health of the billfish stocks important to recreational fisheries.

The *Billfish Angler Survey* card for fishing in the 1998 calendar year, will be mailed out in December of this year. Please complete the survey card and return it by February 1999. Additional 1998 survey cards will be available to billfish anglers through this office. U.S. Government regulations require that we purge our mailing list each year. If you wish to continue to receive the *Billfish Newsletter* but did not fish, please indicate "NO FISHING" on the *Billfish Angler Survey* form and return it to the Center. Your name will be retained.

The value of these data is in trends observed over a long period of time which can be analyzed with other data and events related to commercial catches, weather patterns, local economic changes, and used to identify emerging issues. Monitoring these trends is particularly important because of expanding pelagic fisheries throughout our oceans. The trend analysis from this *Survey* assists in monitoring the impact of this expansion and highlights the importance of recreational fishing for billfish, which contributes economically to many local and regional communities. These catch rates are, however, annual means, calculated over the entire reporting year, and are not indicative of seasonal highs or lows encountered in any particular region.

Billfish anglers responding to the *Billfish Angler Survey* for 1996 reported catching 3,712 billfish during 6,643 fishing days. In 1997, anglers reported catching 5,054 billfish during 11,413 days of fishing. The overall catch per effort (measured in catch per day fished) was 0.56 billfish per angler-day in 1996 and 0.44 in 1997. Results for both fishing years by fishing location are presented in Table 1. The total number of angler-days reported for 1997 increased 72% over 1996. The current overall catch rate of 0.56 (1996) to 0.44 (1997) is higher than the prior four-year average of 0.43 (1992 to 1995). The highest reported catch rate (0.57) occurred during the first years of this Survey (1969 to 1971). The lowest catch rates occurred in the mid-1970s, averaging about 0.34.

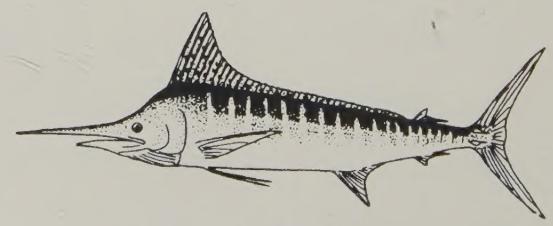
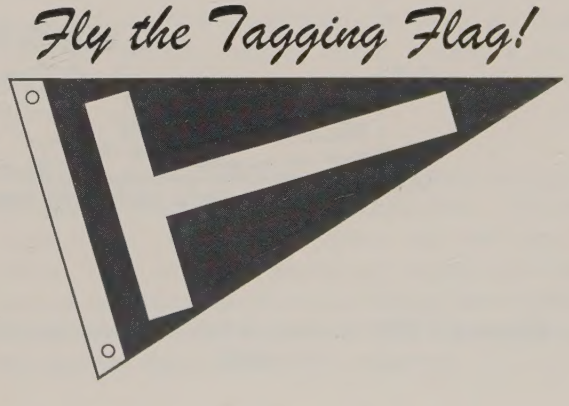


Table 1. Results of 1997 *Billfish Angler Survey*. Data in parentheses are values recorded in 1996. Species codes are striped marlin (SM), blue marlin (BLM), black marlin (BKM), and sailfish (SF).

LOCATION	ANGLER FISHING DAYS	BILLFISH PER FISHING DAY (CPUE)	MAJOR SPECIES
PACIFIC OCEAN			
Hawaii, U.S.A.	5,410 (3,247)	0.38 (0.42)	BLM
Midway Island, U.S.A.	124 (0)	0.24 (0)	BLM
So. California, U.S.A.	2,430 (1,264)	0.12 (0.22)	SM
Baja California Mexico	1,643 (1,236)	0.75 (0.85)	SM
Guaymas, Mexico	44 (13)	0.32 (0.62)	SF
Mazatlan, Manzanillo, Mexico	95 (85)	0.55 (0.64)	SF
Puerto Vallarta, Mexico	22 (18)	0.27 (1.28)	SF
Acapulco, Ixtapa, Zihuatanejo, Mexico	54 (62)	1.31 (2.15)	SF
Revillagigedo Islands, Mexico	150 (0)	0.19 (0)	BLM
Guatemala	33 (17)	8.24 (5.12)	SF
Costa Rica	97 (122)	1.59 (1.89)	SF
Panama	152 (77)	1.51 (1.19)	SF
Colombia	25 (0)	0.20 (0)	SF
Japan	24 (11)	0.37 (0.27)	BLM
Hong Kong	5 (3)	0 (0)	BLM
Guam, U.S.A.	2 (0)	1.50 (0)	BLM
Palau	7 (0)	0 (0)	BLM
Philippines	0 (3)	0 (0.33)	SF
Malaysia	5 (0)	0.40 (0)	BKM
Papua New Guinea	29 (6)	0.21 (2.33)	BLM
Marshall Islands	83 (50)	0.29 (0.28)	BLM
Kiribati	60 (0)	0.40 (0)	SF
Fiji	39 (12)	0.21 (0.50)	SF
Tahiti, French Polynesia	45 (31)	0.42 (0.16)	BLM
Tonga	38 (2)	0.53 (0.50)	BLM
Australia	141 (137)	0.89 (0.81)	BKM
New Zealand	144 (47)	0.65 (0.38)	SM
INDIAN OCEAN			
Tanzania	4 (1)	0 (1.00)	SWO
Kenya	89 (84)	1.33 (0.89)	SF
Mauritius	10 (28)	0.40 (0.29)	BLM
Seychelles, S.A.	11 (14)	0.36 (0.14)	SF
Maldives	7 (0)	0.14 (0)	SF
United Arab Emerates	21 (24)	2.57 (3.33)	SF
Thailand	16 (2)	0.87 (11.50)	SF
ATLANTIC OCEAN			
Atlantic total	306 (47)	0.21 (0.81)	SF

Trends in angler catch rate recorded throughout the *Billfish Angler Survey* are shown graphically, by location, in Figure 1. In 1997, high catch rates (0.51) for striped marlin were reported at the southern tip of Baja California Sur and were 0.42 for all of Mexico. High catch rates were reported for blue marlin in Hawaii (0.22), Marshall Islands (0.24), Mauritius (0.30) and Tahiti (0.36). Australia (0.70) and Panama (0.16) reported the highest catch rates for black marlin. Excellent fishing for sailfish was reported from Mazatlan, Mexico, southward through southern Mexico (0.65), Guatemala (8.21), Costa Rica (1.37) and Panama (1.17). Anglers in the Indian Ocean reported 1.21 billfish per angler day with excellent fishing in the Persian Gulf (U.A.E., 2.57) and Kenya (1.33).



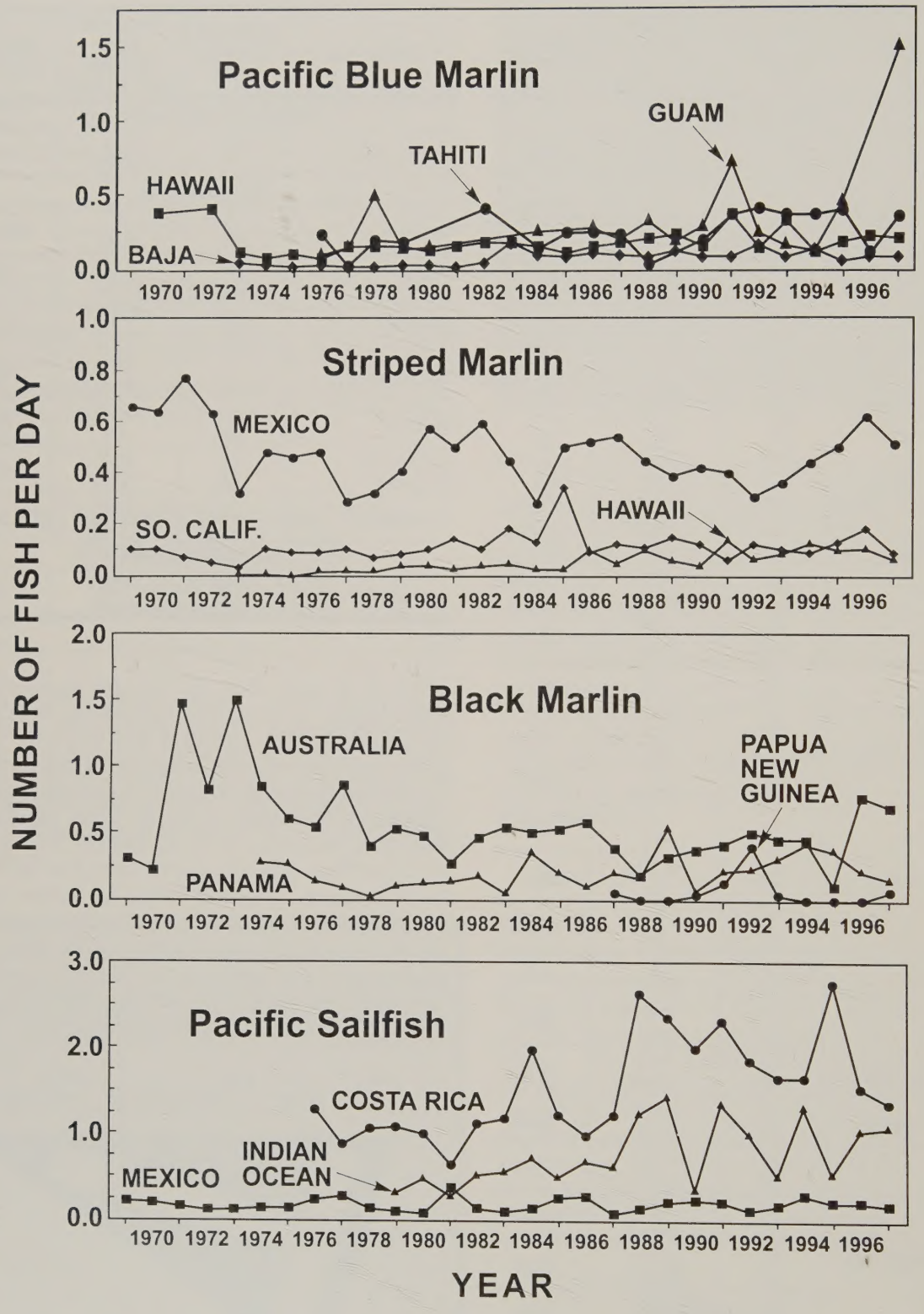


Figure 1. CPUE (number of fish/angler day) for striped marlin, blue marlin, black marlin, and sailfish reported by region, 1969-1997.

COOPERATIVE MARINE GAME FISH TAGGING PROGRAM

The *Billfish Tagging Program,* which began in 1963 utilizes release and recapture data from tagged billfish to determine movement, distribution and growth patterns of billfish. The *Program* encourages the participation and cooperation of recreational anglers, sportfishing organizations and commercial fishers.

The *Billfish Tagging Report* cards received in 1997 indicate a total of 853 billfish were tagged and released by 542 anglers and 219 fishing captains. This is 34% fewer tag releases than reported in 1996 and was the third year of decreased tagging effort. The decrease was evident across all billfish species and all regions (Table 2). The reason for this decrease is not clear. Both recreational anglers and commercial fishers are concerned about fish resources and are aware of fishery problems. Many anglers and fishers participate in tag and release because of these increasing concerns and choose to support science-based conservation efforts. One possible explanation may be linked to the strong El Niño condition in 1997. During the last major El Niño (1982 - 1983), however, tagging effort actually increased. It is possible that billfish movement patterns changed because of the recent El Niño event and they were not available to anglers in traditional areas.

Table 2. Summary of billfish tagged in 1997.

AREA	SPECIES	TOTAL
PACIFIC OCEAN		
Southern California, U.S.A.	Striped Marlin	89
	Marlin, unid.	7
Hawaii, U.S.A.	Blue Marlin	310
	Striped Marlin	80
	Black Marlin	1
	Short-billed Spearfish	49
	Broadbill Swordfish	25
	Sailfish	2
	Marlin, unid.	4
	Billfish, unid.	2
Baja California, Mexico	Blue Marlin	9
	Striped Marlin	109
	Sailfish	34
	Marlin, unid.	7
	Billfish, unid.	1
Nicaragua	Sailfish	1
Costa Rica	Sailfish	3
Panama	Blue Marlin	3
	Black Marlin	7
	Sailfish	2
Midway Island, U.S.A.	Blue Marlin	16
	Striped Marlin	1
	Sailfish	3
Marshall Islands	Blue Marlin	9
	Short-billed Spearfish	1
Tahiti, French Polynesia	Blue Marlin	28
	Sailfish	2
INDIAN OCEAN		
Kenya	Sailfish	3
Mauritius	Blue Marlin	1
United Arab Emirates	Sailfish	44
TOTAL		853

We gratefully recognize the anglers, captains and fishers who tag and release billfish. In 1997, 542 individual anglers reported tagging at least one billfish. Individual recognition of each angler who reported tagging two or more billfish in 1997 are listed in Table 3. We regret not being able to acknowledge all 542 by name in this year's newsletter. We also list the captains of charter and private boats who tagged significant numbers of billfish in specific regions (Table 4). Continued interest and cooperation by these captains has greatly enhanced the *Billfish Tagging Program,* and their efforts are truly appreciated.

TAG RECOVERIES IN 1997

Nineteen recaptures were reported in 1997 including: seven striped marlin, eight blue marlin, one sailfish, two swordfish and one shortfin mako shark (Table 5). Unfortunately the release information (Billfish Tagging Report) has not yet been received for one striped marlin and three blue marlin. Please check your records, tackle boxes, salon cabinets, etc., for any of the yellow BILLFISH TAGGING REPORT cards which may have been completed but inadvertently have not yet been mailed to the SWFSC. Tag and release does no good if we do not receive the release information here at the SWFSC. A list of recaptured billfish tags without release information is provided in Table 6.

Significant results were obtained in 1997 from recaptured striped marlin, blue marlin, and swordfish. Of the seven striped marlin recaptured, two had been tagged off Santa Catalina Island, California, and traveled east to Hawaii in what has become a familiar pattern. Another striped marlin tagged off Kailua-Kona, Hawaii had been at liberty for nearly two years before being recaptured near New Caledonia 3,508 nmi to the south. The three remaining striped marlin showed a more common pattern of movement around the islands of Hawaii.

Of the eight blue marlin tag recaptures, one was tagged off Keahole Point, Hawaii, and traveled west 1,744 nmi where it was captured near Taiwan after 808 days at liberty. Three other blue marlin were tagged and recaptured in and around the Hawaiian Islands, one of which was recaptured only seven nautical miles from the release site after 349 days at liberty.

Table 3. Names of anglers tagging substantial numbers of billfish, and the number of billfish tagged and released. From Billfish Tagging Report cards received for 1997 calendar year releases.

ANGLER NAME	BILLFISH TAGGED
HAWAII, U.S.A.	
Dan Folkman	7
Sue Stolzman	7
Don Brandt	5
Bob Creedon	5
Ralph Conner	4
John R. Ribeiro Sr.	4
Frederick A. Richburg	4
Debra Jane Baldwin	3
John Copeland	3
Kazunori Kato	3
Michael M. Kenworthy	3
Janet B. Martic	3
T. Neal McNamara	3
Jack Sanford	3
Rick Shedore	3
Larry Smith	3
Natalie Smith	3
Richard D. Terra	3
Francis Tomei	3
Joe Bartek	2
Pam Basco	2
Carol B. Behan	2
Michael R. Bonsignore	2
Don Chockman	2
Charles E. Commander III	2
Simon Devitt	2
Dave Elm	2
Tom Feichtinger	2
Larry M. Fillhart	2
Ralph P. Guttman	2
Jake Jacobson	2
Gerald Lowrey	2
Linda McLaughlin	2
Michael Monti	2
Angereau G. Ormsby Jr.	2
Bob Patten	2
Henry Potts	2
Oskie Rice	2
Steve Schumacher	2
Walter Seipel	2
Keishi Shiohata	2
Mandy Shiraki	2
Arlen Steiner	2
Richard Svetich	2
Yoshinori Takano	2
Kohei Ushimura	2
Luc Vandewalle	2
Michael A. Vidal	2
Jose Vivas Jr.	2
Donald E. Willis	2
Steve Zehring	2
BAJA CALIFORNIA, MEXICO	
Don Anderson	23
Steve Brackmann	7
Gary Jasper	7
Lynn Jasper	7
William E. Little	4
Michael McGrade	4
David Wishney	4
Charles Burbage	3
Geoff Halpern	3
Martin L. Morris	3

ANGLER NAME	BILLFISH TAGGED
BAJA CALIFORNIA, Continued	
Don Roon	3
Bernard Wishney	3
Kevin Bohannon	2
Shera Grant	2
John Grant	2
John Grim	2
Scott Halley	2
Bunker A. Hill	2
Rick Krueger	2
Paul Lepore	2
Randall A. Marsden	2
Timothy R. Port	2
Philip Potter	2
Rick Rayl	2
Jim Sieminski	2
Clarke A. Smith	2
Michael Stapleman	2
Jim Volker	2
Mark Walker	2
SOUTHERN CALIFORNIA, U.S.A.	
David M. Denholm	6
Douglas A. Daniels	5
Mark Warner	4
Stan Ecklund Sr.	3
Reed Miller	3
Gerald A. Garrett	2
April Grennan	2
Jim Hori	2
William Jahn	2
Gary Jasper	2
Danny Lee Jones	2
Jim Kingsmill	2
Michele B. Kogler	2
Robert Woodard	2
UNITED ARAB EMIRATES	
Barry W. Panzer	3
Rick Le Monnier	2
TAHITI, FRENCH POLYNESIA	
Francis Petras	3
Moana Allain	2
Parea Moeino	2
Georges Nedelec	2
Winiki Sage	2
MIDWAY ISLAND, U.S.A.	
John R. Bone	3
Samuel H. Bellezza	2
Richard J. Cyrus	2
Mike Sakamoto	2
PANAMA, CENTRAL AMERICA	
Robert L. Adleta	2
Jon Beacher	2
Irwin Belli	2
MARSHALL ISLANDS, U.S.A.	
David L. Bauer	2
KENYA, AFRICA	
Erich Huber	2

Of the two swordfish tags returned, one was at liberty just over four years and was recaptured 242 nmi from where it was tagged. This location is north of Hawaii and within an area of considerable international commercial fishing for swordfish extending into the northern transition zone. The other swordfish was tagged and recaptured in the Atlantic Ocean. This fish had been tagged on the Grand Banks and was at liberty for 2.6 years when recaptured off Morocco, a distance of 2,004 nmi.

Although the focus of the *Billfish Tagging Program* is on billfish, a variety of other species have been tagged (Table 7). A total of 45,411 individual fish representing 78 separate species have been tagged and released since 1963. There have been 645 recoveries for an overall recovery rate of 1.42%. Billfish account for 90% of the releases and 76% of the recoveries. Striped marlin account for 44% of all fish tagged while sailfish account for 16%, blue marlin 11% and black marlin 7%. Of the billfish, swordfish and black marlin have the highest rates of return 2.85% and 2.07%, respectively, followed closely by striped marlin with 1.63% returns.

TAG RECAPTURE DATA INDICATE INTERNATIONAL MONITORING REQUIRED

Long term recapture rates are: swordfish 2.85%, black marlin 2.07%, striped marlin 1.63%, blue marlin 1.00%, sailfish 0.39%. Twenty-nine percent (29%) of recaptures occur within the first month after release and 84% within the first year. Only 2% of recaptures occur after three years. This seemingly low rate of return is consistent with other tag and release programs. A few of the basic reasons for this include: the billfish population is large and the probability of recapturing tagged billfish is low, some fish may die after tagging, tags are shed before recapture and some recaptured tags are not returned. Our Billfish Tagging Program will begin using a newly designed tag in 1998 that offers to increase survival and reduce tag shedding.

The recapture data show patterns that unequivocally indicate billfish travel long distances and routinely make trans-Pacific and equatorial crossings. This movement exposes them to numerous international commercial and recreational fisheries over their lifetime. Fishery interactions could therefore be significant, both on the high-seas and within the economic zones of the numerous countries throughout the Pacific. Clearly, international monitoring and cooperation is needed to understand the extent of fishery interactions and the health of the Pacific billfish resource.

Table 4. Names of captains tagging substantial numbers of billfish, and the number of billfish tagged and released. From Billfish Tagging Report cards received for 1997 calendar year releases.

CAPTAIN NAME	TOTAL
HAWAII, U.S.A.	
Capt. Kelley Everette	33
Capt. Scott M. Fuller	22
Capt. Tad Luckey	19
Capt. Charles E. Haupert	18
Capt. Robert McGuckin	17
Capt. Jerry Allen	14
Capt. John Jordan	13
Capt. F. Mcgrew Rice	13
Capt. Mark Shultz	12
Capt. James C. Dean	11
Capt. Marty L. Sands	11
Capt. Bill Crawford	10
Capt. Jeff Fay	10
Capt. Peter Hoogs	9
Capt. Guy Terwilliger	9
Capt. Dennis Harris	8
Capt. Fran O'Brien	8
Capt. Gus Sellers	8
Capt. Mike Hasbrouck	7
Capt. Dale Leverone	7
Capt. Robert Russell	7
Capt. Kevin M. Hogan	6
Capt. Gary Quam	6
Capt. Tom Siebler	6
Capt. John C. Baldwin	5
Capt. Boyd De Coito	5
Capt. Leon Lange	5
Capt. James M. Svetich	5
Capt. Bill Casey	4
Capt. Daniel J. Harrigan	4
Capt. Doug Pattengill	4
Capt. Harley Sellers	4
Capt. Doug Armfield	3
Capt. Momi Bean	3
Capt. Tony Clark	3
Capt. Tim E. Hicks	3
Capt. Norm Isaacs	3
Capt. Steven D. Kaiser	3
Capt. Robert A. Morris	3
Capt. Marlin Parker	3
Capt. Freeman A. Roberts	3
Capt. Dudley B. Worthy	3
Capt. Joseph Yurkanin	3
Capt. Allan Ayano	2
Capt. John Burke	2
Capt. Joseph Demarke	2
Capt. C. Bruce Evans	2
Capt. Gary Hicks	2
Capt. Glen Hodson	2
Capt. Darrin Isaacs	2
Capt. Chris Lightfoot	2
Capt. Kent Mongreig	2
Capt. Pat Nelson	2
Capt. Randy Parker	2
Capt. Allan Price	2
Capt. Earl Shook Jr.	2
Capt. Rusty Unger	2
Capt. Gene Vanderhoek	2
Capt. Jeff Vermillion	2
Capt. James G. Ward	2
Capt. Rick White	2
Capt. Chuck Wigzell	2
BAJA CALIFORNIA, MEXICO	
Capt. Peter E. Wishney	30
Capt. Martin Verdugo Collins	23
Capt. Thomas A. Shanahan	17
Capt. David Brackmann	13
Capt. Cooke Bausman III	8

CAPTAIN NAME	TOTAL
BAJA CALIFORNIA, MEXICO, Continued	
Capt. Bernard A. Guentner	6
Capt. Jose Verduzco	5
Capt. Doug Armstrong	4
Capt. Alberto Cota	4
Capt. Martin L. Morris	4
Capt. Brad Titcomb	4
Capt. Terry Bersuch	3
Capt. Geoff Halpern	3
Capt. Gary P. Hill	3
Capt. John Talsky	3
Capt. Andy Crean	2
Capt. Troy Grant	2
Capt. Bunker A. Hill	2
Capt. Michael R. Hurt	2
Capt. Danny Lee Jones	2
Capt. P. Neff Nash	2
Capt. Richard Sieminski	2
Capt. Eric A. Wahrenbrock	2
SOUTHERN CALIFORNIA, U.S.A.	
Capt. Ken Brookins	9
Capt. Kendall W. Knight Jr.	8
Capt. Doug Carson	6
Capt. Billy Miyagawa Jr.	5
Capt. Michael R. Hurt	4
Capt. Kathy Henderson	3
Capt. Ron Johnson	3
Capt. Tom Patierno	3
Capt. Thomas A. Shanahan	3
Capt. Richard Sieminski	3
Capt. J. Gordon Bateman	3
Capt. Steve Bell	2
Capt. David M. Denholm	2
Capt. Marvin Garrett	2
Capt. Bill Kingsmill	2
Capt. Karl Kogler	2
Capt. Martin L. Morris	2
Capt. Don Schumacher	2
Capt. Mike Thomas	2
Capt. Jim Tolliver	2
UNITED ARAB EMIRATES	
John Houlihan	44
TAHITI, FRENCH POLYNESIA	
Capt. Jacques Solari	4
Capt. Jacques Chongue	3
Capt. Yvonnic Allain	2
Capt. Francis Blais	2
Capt. Georges Poroi	2
Capt. Eric Smith	2
Capt. Jean-Pierre Tanguy	2
MIDWAY ISLAND, U.S.A.	
Capt. Tim Hetherington	7
Capt. Chris Sheeder	5
Capt. Bill Boagey	4
Capt. Mike Strait	4
PANAMA, CENTRAL AMERICA	
Capt. Candelo	4
Capt. Libardo	3
Capt. Matias	2
MARSHALL ISLANDS, U.S.A.	
Capt. Wally Milne	4
Capt. Baron Bigler	2
COSTA RICA, CENTRAL AMERICA	
Capt. Thomas Carton	2

Table 5. Tag recovery information.

TAGGER/CAPTAIN	RELEASE DATE	RELEASE LOCATION	RECOVERY DATE	RECOVERY LOCATION	DAYS FREE	MILES/ DIRECTION TRAVELED
STRIPED MARLIN						
NO RELEASE DATA Tag # A-28245	-	-	03/05/97	19°27'N 156°11'W Kona, HI	-	-
Melissa Pennell Norm Isaacs	02/06/97	19°30'N 156°00'W Kailua-Kona, HI	02/23/97	14°50'N 158°57'W	17	327 - SSW
Robert Freeman Randy Orkisch	02/02/96	21°10'N 156°45'W Molokai, HI	10/31/96	19°17'N 148°11'W	272	495 - ESE
Reed Miller Ron Johnson	09/12/96	33°16'N 118°24'W Santa Catalina Is.	05/22/97	26°11'N 167°29'W Hawaii	252	2,569 - WSW
Bill Lescher Mike Callen	10/07/95	33°04'N 118°20'W Santa Catalina Is.	05/29/97	25°30'N 162°00'W Hawaii	600	2,313 - WSW
John F. Bruns Gene Vanderhoek	06/30/96	19°30'N 156°00'W Kailua-Kona, HI	08/03/97	19°50'N 158°36'W	399	148 - WNW
David Barnes Dennis Harris	08/10/95	19°30'N 156°00'W Kailua-Kona, HI	07/30/97	24°33'S 164°30'E New Caledonia	720	3,508 - SSW
BLUE MARLIN						
Oskie Rice F. McGrew Rice	04/16/94	19°44'N 156°03'W Keahole Pt., HI	07/02/96	24°22'N 172°55'E Taiwan	808	1,744 - WNW
Jon Kilik Pete Hoogs	12/25/95	19°39'N 156°03'W Kailua-Kona, HI	11/19/96	14°53'N 154°22'W	330	301 - SSE
Ian Kinvig Mike Rand	07/08/96	19°38'N 155°59'W Kailua-Kona, HI	06/21/97	19°44'N 156°03'W Kailua-Kona, HI	349	7 - NNW
Rick Bush Wally Milne	08/02/97	07°02'N 171°40'E Marshall Islands	08/15/97	06°19'N 174°23'E Marshall Islands	13	168 - ESE
Mark Landwer Randy Orkisch	04/06/96	20°33'N 156°37'W Alenuihihi Ch., HI	12/23/97	21°24'N 158°15'W Oahu, HI	626	105 - WNW
NO RELEASE DATA Tag # A-24037	-	-	05/03/97	18°45'N 161°30'W	-	-
NO RELEASE DATA Tag # W-1675	-	-	10/16/97	20°40'N 157°03'W Lanai, HI	-	-
NO RELEASE DATA Tag # W-2511	-	-	11/25/97	19°32'N 156°04'W Kailua-Kona, HI	-	-
SAILFISH						
Gregory Usita	08/12/97	19°30'N 156°05'W Kailua-Kona, HI	08/24/97	20°00'N 160°53'W	12	273 - WNW
SWORDFISH						
Dave Ghigliotty	04/28/93	27°45'N 153°10'W NE of Hawaii	05/27/97	23°43'N 153°08'W NE of Hawaii	1,490	242 - SSE
Steve Sexton	11/15/94	41°06'N 48°29'W Grand Banks	06/23/97	35°48'N 05°56'W Morocco	951	2,004 - ESE
SHORTFIN MAKO SHARK						
John Bethel	02/18/95	35°15'S 174°20'E New Zealand	11/14/96	16°16'S 171°46'E Samoa	635	1,147 - NNE

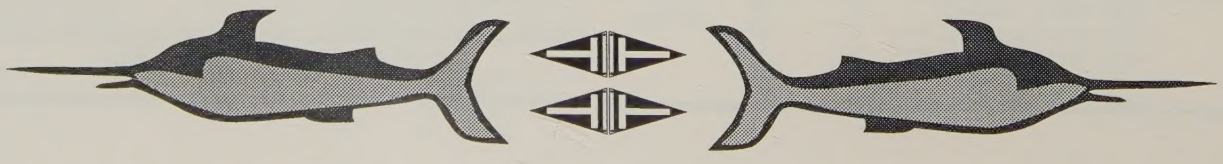


Table 6. Recaptured billfish tag numbers without release information. Please check your records for information on these missing tag releases.

TAG #	SPECIES	YEAR RECOVERED
A-000175	SM	1986
A-001437	SM	1988
A-001575	YFT	1995
A-004581	SM	1989
A-006046	SM	1988
A-007336	SM	1989
A-008285	SM	1989
A-009353	SM	1990
A-009387	SM	1989
A-009738	SM	1989
A-011409	SM	1989
A-015345	SM	1995
A-019327	SM	1991
A-020380	BLM	1993
A-020395	BKM	1996
A-020760	BLM	1994
A-021137	SM	1993
A-023671	BF	1993
A-024037	BLM	1997
A-028245	SM	1997
A-034786	BF	1997
H-003032	BKM	1973
H-005914	SM	1974
H-009539	SM	1986
H-016797	SM	1986
H-018930	BKM	1977
H-019741	SM	1982
H-022095	SM	1982
H-025753	SM	1986
H-027406	SM	1979
H-027597	SM	1979
H-029600	BLM	1979
H-029767	BLM	1979
H-031382	SM	1980
H-034713	BLM	1982
H-037204	SM	1987
H-039861	SM	1981
H-039868	SM	1981
H-040077	SM	1983
H-042716	SM	1984
H-043017	SM	1990
H-046699	SM	1988
H-051032	SM	1987
H-051697	SM	1987
FM-000543	SM	1967
FM-004065	SF	1965
FM-004283	SM	1966
FM-005308	SM	1968
FM-005348	SM	1968
FM-006051	SM	1970
FM-006239	SM	1967
FM-006261	SM	1967
FM-009522	SF	1967
FM-009939	SM	1967
FM-028107	SM	1970
W-001675	BLM	1997
W-002511	BLM	1997

Table 7. Summary of all fish tagged in 1997 with releases and recoveries for 1963-1997.

Species Name	Releases 1997	Releases Total	Recoveries Number	Rate %
Striped Marlin	279	19,831	324	1.63
Sailfish	94	7,401	29	0.39
Blue Marlin, Pacific	376	4,809	48	1.00
Billfish, unid.	21	4,261	3	0.07
Black Marlin	8	3,338	69	2.07
Shortfin Mako Shark	13	1,092	24	2.20
Roosterfish	-	920	29	3.15
Short-billed Spearfish	50	647	0	0.00
Yellowtail	-	492	36	7.32
Broadbill Swordfish	25	492	14	2.85
Dolphinfish (Mahi Mahi)	1	407	3	0.74
Yellowfin Tuna	18	339	25	7.37
Blue Shark	16	310	5	1.61
Skipjack Tuna	1	97	2	2.06
Bat Ray	-	84	0	0.00
Albacore Tuna	-	79	0	0.00
Bigeye Tuna	-	76	2	2.63
Hammerhead Shark	-	51	2	3.92
White Sturgeon	-	50	1	2.00
Black Sea Bass	-	40	8	20.00
Leopard Shark	-	39	1	2.56
Bronze Whaler Shark	1	36	1	2.94
Wahoo	2	35	2	5.71
Whitetip Shark	-	33	0	0.00
Jack Cravelle	-	32	0	0.00
Blue Cravelle	28	30	1	3.33
Thresher Shark	-	30	1	3.33
Barracuda	-	23	2	8.70
Bluefin Tuna	-	19	1	5.26
Tiger Shark	-	17	2	11.76
Striped Bass	-	11	0	0.00
White Marlin	-	13	1	7.69
Whale Shark	-	5	1	20.00
All Others	5	272	8	2.94
Total	**938**	**45,411**	**645**	**1.42**

COMMERCIAL LANDINGS OF BILLFISH IN THE PACIFIC

Commercial fishing for billfish in the Pacific has been conducted since at least the turn of the century, though much of it was incidental to fishing for tuna. By early 1950s, Asian longline vessels were exploring the western and central Pacific for tuna and billfish. By the mid-1950s and 1960s, Japanese flag vessels expanded into the eastern Pacific and were expending considerable effort for marlins and sailfish off Mexico. Highest reported landings of marlins occurred during the 1950s and 1960s as the fisheries were expanding across the Pacific. By 1970 much of this fishing effort was turned toward the more deep water bigeye tuna which reduced the number of marlin taken. Taiwan and Korea concentrated fishing effort

mainly on tuna in the central and south Pacific during this period and billfish catches were low.

Current commercial landings of marlins, sailfish and swordfish in the Pacific exceed 77,000 metric tons annually. These catches of billfish in the Pacific are principally bycatches made by longliners fishing for and targeting tuna. Current Food and Agriculture Organization (FAO) fishery statistics indicate Pacific-wide catches of marlins and sailfish are below historic levels (Figure 2).

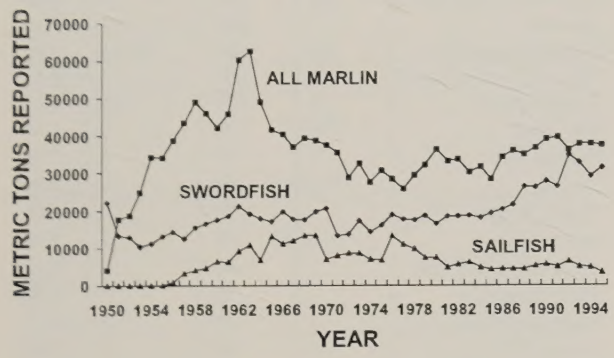


Figure 2. Pacific billfish landings, FAO statistics, 1950-1995.

Pacific-wide landings of sailfish peaked at over 13,000 mt during the 1960s, declined during the 1970s and have been fairly consistent at about 5,000 mt since 1980. Between 1991 and 1995 landings of blue marlin average 22,800 mt, striped marlin average 11,500 mt, and black marlin average 3,400 mt. Swordfish make up 37% of Pacific wide landings. Blue marlin account for 28%, striped marlin 14%, sailfish 6% and black marlin 4% (Figure 3).

Pacific swordfish catches continue to increase because of continuing demand, increased value, and increases in effort due to decreased production from Atlantic stocks. Japan, Taiwan, the United States and Chile are the largest producers of swordfish in the Pacific. There has also been a rapid growth of swordfish fisheries from central and South American countries especially from Chile (Figure 4). There is no indication of over fishing Pacific swordfish at this time.

Currently there is no management plan or international regulatory agency to manage billfish stocks in the Pacific. Fishery data from the major fisheries is being monitored by resource agencies. The Western Pacific Fishery Management Council has the lead in managing Pacific swordfish and other pelagic species in the United States EEZ.

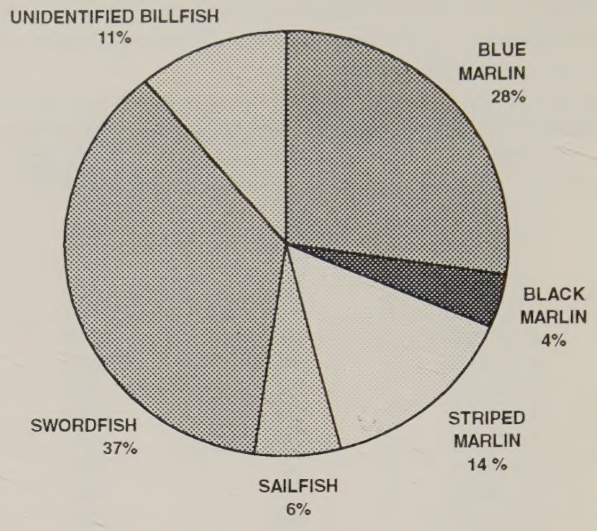


Figure 3. Percent of Pacific billfish landings, FAO statistics, 1991-1995.

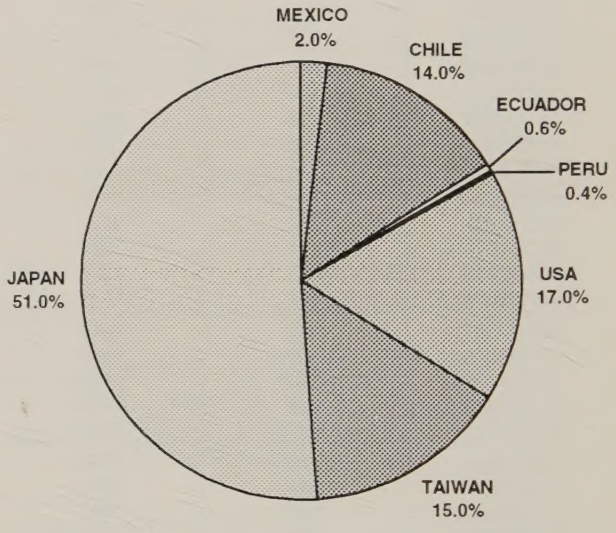


Figure 4. Percent of swordfish harvest by country, 1991-1995.

The Interim Scientific Committee and the Standing Committee on Billfish and Tuna were both recently established by international treaty to monitor and investigate the status of commercially important stocks of highly migratory species in the Pacific.

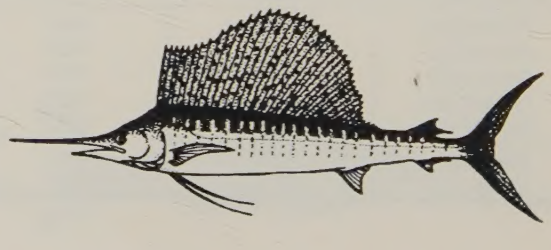


Table 8. Preliminary tag release information from The Billfish Foundation records for the Pacific, 1990-1996.

AREA	SPECIES	TOTAL
PACIFIC OCEAN		
Southern California, U.S.A.	Blue Marlin	7
	Striped Marlin	105
	Sailfish	1
Hawaii, U.S.A.	Blue Marlin	314
	Striped Marlin	172
	Black Marlin	2
	Short-billed Spearfish	113
	Sailfish	2
Baja California, Mexico	Blue Marlin	228
	Striped Marlin	1191
	Black Marlin	18
	Sailfish	226
	Short-billed Spearfish	2
Mazatlan-Manzanillo, Acapulco, Mexico	Blue Marlin	14
	Blue Striped Marlin	10
	Black Marlin	1
	Sailfish	664
Costa Rica	Blue Marlin	81
	Striped Marlin	11
	Black Marlin	20
	Sailfish	856
Panama and Colombia	Blue Marlin	97
	Black Marlin	423
	Sailfish	3408
	Striped Marlin	84
Guam, U.S.A.	Blue Marlin	133
	Sailfish	10
	Short-billed Spearfish	6
Tahiti	Blue Marlin	8
	Striped Marlin	1
Fiji	Blue Marlin	1
	Sailfish	2
Malaysia	Blue Marlin	11
	Black Marlin	1
	Sailfish	382
Australia	Blue Marlin	2
	Striped Marlin	14
	Black Marlin	635
	Sailfish	76
New Zealand	Striped Marlin	150
	Short-billed Spearfish	2

COOPERATING STUDIES

* Southwest Fisheries Science Center and The Billfish Foundation collaborate on Pacific tagging results.

In 1997 the SWFSC and The Billfish Foundation (TBF) joined in a cooperative effort to report combined results of tagging programs in the Pacific for both organizations. That study is currently underway. A preliminary summary of TBF tag release data, by species and region, is shown in Table 8. In the seven-year period 1990 to 1996, TBF anglers released over 9,500 tagged Pacific billfish. The overall recapture rate of 1.38% is nearly identical to that of the SWFSC's Tagging Program (1.42%). Further results of this cooperative effort will be summarized in future Billfish Newsletters.

* Southwest Fisheries Science Center partnership with AFTCO's Tag/Flag Tournament in the Pacific

AFTCO's popular Tag/Flag Tournament expanded into the Pacific in 1997. The year-long tagging tournament runs from November 1 to October 31. The Tournament promotes the conservation of highly migratory species through tag and release programs and is supported by numerous organizations including the International Game Fishing Association, National Coalition for Marine Conservation, American Sportfishing Organization, The Billfish Foundation and many popular sportfishing publications.

Anglers who tag Pacific billfish, bluefin tuna, thresher and mako sharks (and return the completed BILLFISH TAGGING REPORT cards) are automatically entered in the tournament. The SWFSC will provide the AFTCO Tournament with tag release information for its tagging program. We also provide tagging supplies to participating anglers tagging billfish and bluefin tuna. Tags for tagging sharks are available from the California Department of Fish and Game (Phone 562/590-4801). Tournament rules and general information can be obtained by calling (714) 660-8757.

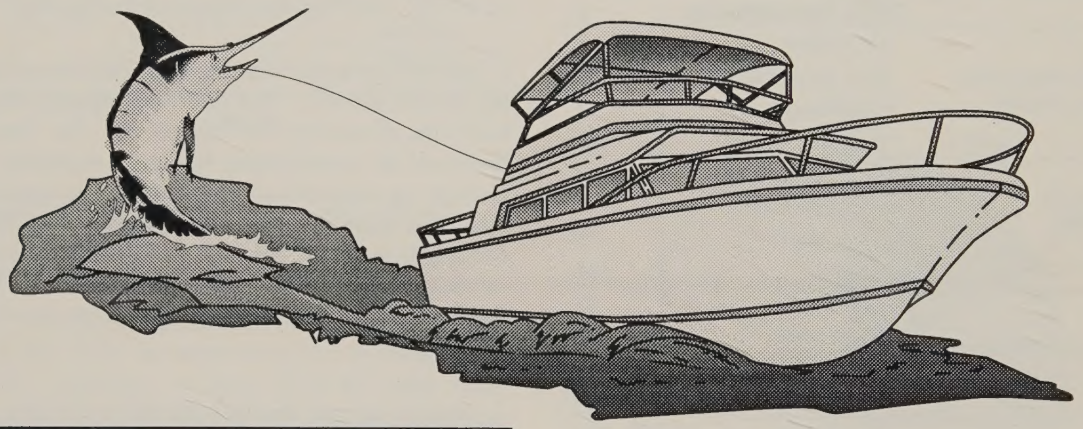
The SWFSC supports angler-based tag and release programs that promote resource conservation and scientific advancement. High-stakes competitive tagging of any species where maximizing the number of tagged fish may jeopardize conservation or scientific results is not encouraged by the Cooperative Billfish Tagging Program. Always practice ethical tagging techniques that use your best skills in the capture, tag application and release of all fish. Practicing good tagging procedures and skills saves billfish and increases survival. Proper tagging technique involves taking the time to bring your fish under control, leader it to the side of the vessel, applying the tag behind

the head and above the lateral line, removing the hook when possible and releasing the fish as soon as it is able to swim on its own. Billfish, skillfully tagged and quickly released, have an excellent chance to live and fight another day and to provide scientific information used by fishery managers to ensure a sustained resource.

NEW TAG DESIGN

The design of billfish tags have changed several times since the *Billfish Tagging Program* began in 1963. Each new design brought improved tag recapture rates indicating greater survival and better tag retention. This coming year, the SWFSC will convert to the new HM series (Highly-Migratory) tags with the nylon anchor tips. While the standard stainless steel H-type tags served well, recently completed studies show improved tag retention with the nylon tag tips. These are used by our Atlantic Billfish Tagging Program based in Miami, Florida (Southeast Fisheries Science Center) and are similar to the tags provided by The Billfish Foundation. They have a lower shedding rate and improve the recapture rate.

The new tags will be phased into the program as our current inventory of stainless steel tipped tags are used. Anglers should continue to use issued stainless steel tags until gone. The new HM tags require a new design of the applicator pin. The new applicator pins will be provided with the new tags as we complete the transition. The actual tagging procedure will not change markedly with the new HM tags, and instruction will be provided. We wish to thank the Los Angeles County Fish and Game Commission for providing 1,300 new tag applicator pins. Their generous gift makes it possible to begin phasing the HM series tags into our Program this year.



PAPER REDUCTION ACT NOTIFICATION

The federal Paper Reduction Act requires we provide reporting burden to all Survey respondents and billfish taggers. The reporting burden to complete the Billfish Angler Survey card and the Billfish Tagging Report is estimated to average five minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Southwest Fisheries Science Center, P.O Box 271, La Jolla, CA 92038.

Notwithstanding any other provision of the law, no person is required to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that Collection of information displays a currently valid OMB Control Number.

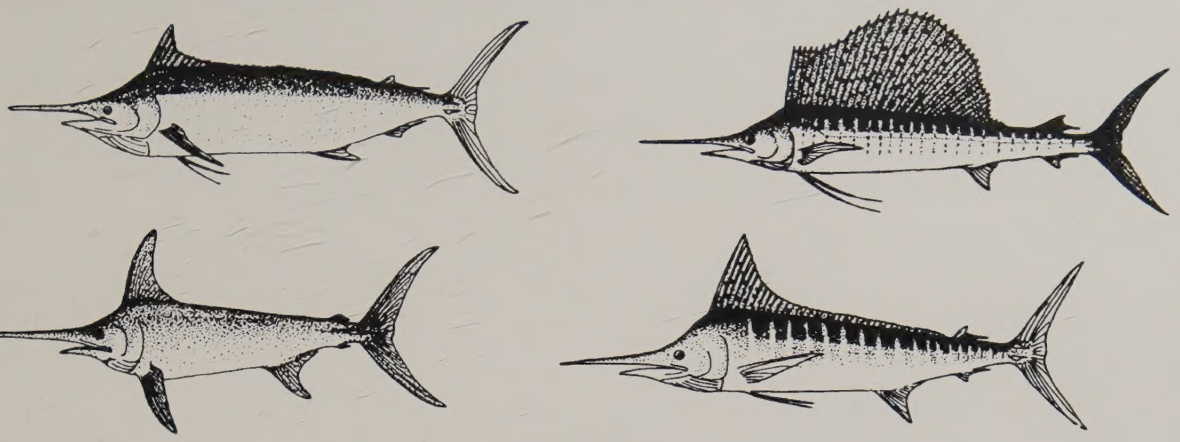
TAGGING SUPPLIES are available to billfish anglers through this office and the following locations:

Southern California
- — San Diego Marlin Club, San Diego, California
- — Balboa Angling Club, Newport beach, California
- — Catalina Seafood, end of Avalon Pier, Catalina Island

Hawaii
- — Pacific Ocean Research Foundation (PORF), Kailua-Kona
- — SWFSC, Honolulu Laboratory
- — Lahaina Yacht Club, Maui, HI

Panama
- — Tropic Star Lodge

Tahiti
- — Haura Fishing Club



TIPS TO SUCCESSFULLY TAG YOUR BILLFISH

BEFORE YOU CATCH YOUR FISH:

- First decide if this fish is to be tagged and released.
- Rig terminal tackle with a single hook.
- Attach the tag to the tagging stick and stow in a safe place.
- Place the *BILLFISH TAGGING REPORT* card in a safe, dry location.

WHILE HOOKED-UP:

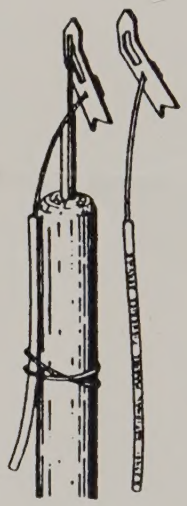
- Leader your fish quickly, usually within 20 to 30 minutes.
- Allow the fish to calm down prior to tagging. Do not attempt to tag a fish while it is jumping or thrashing about.

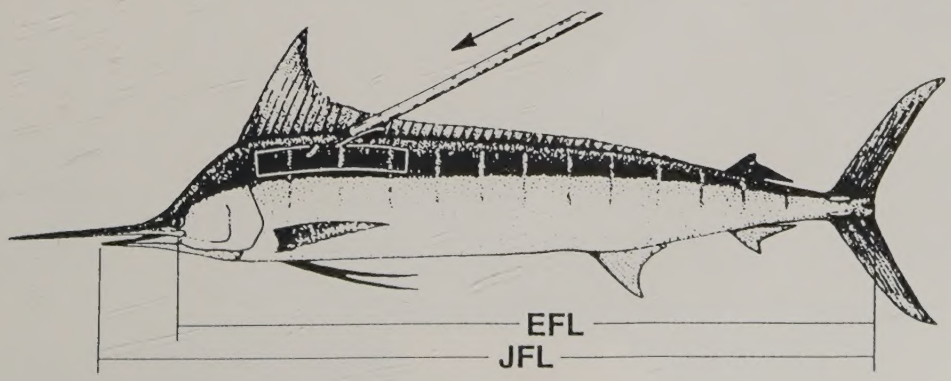
TAGGING:

- Lead the fish alongside the boat.
- Once the fish calms down, insert the tag in the dorsal (back) muscle just below and behind the tallest part of the dorsal fin. Avoid any chance of inserting the tag in the gill, head or below the lateral line.
- Insert the tag a full two inches into the muscle at an angle matching the flow of water over the fish's back.
- The fish should be tagged without *excessive* handling or allowing it to injure itself on the vessel's hull or transom.

RELEASING:

- Remove the hook with a good pair of pliers. If deeply hooked in the throat or stomach, release it by cutting the leader as close to the hook as possible.
- A fish that appears lethargic, but otherwise uninjured, can often be revived by slowly towing it through the water, forcing water through the gills until it begins to swim on its own. Even a fish that has thrown its stomach can still be released.
- Last and most important. Fill out the yellow *BILLFISH TAGGING REPORT* card and mail it to this office.





COMPLETING THE BILLFISH TAGGING REPORT CARD

- Fill out the card completely and as accurately as possible.
- Indicate latitude, longitude and locally known fishing area.
- Estimate the length of the fish as
  1. "eye-to-fork" length (EFL)
  2. "tip of lower jaw-to-fork" length (JFL).
- Estimate weight of the fish.
- Include any remarks, club name and complete address of the angler and the boat captain.
- Return cards promptly to the Southwest Fisheries Science Center. Tagging is of no value unless this *Billfish Tagging Report* card is returned. Postage is paid if mailed in the U.S.A.

NOAA, National Marine Fisheries Service
BILLFISH TAGGING REPORT If mailing outside USA, postage must be affixed
PLEASE FILL IN DETAILS AND MAIL TODAY. Please return card Otherwise tagging is of no value

Latitude: 33°12' N Longitude: 118°10'W
Locality: The Slide, Catalina Island, CA
Species: Striped Marlin Date: July 14, 1998
Estimate length (tip of jaw to fork of tail): 78 inches. Weight: 110 lbs.
Fish Condition: Good, hook removed Bait type: live mackerel
Angler: Marla Marlin Fight time (minutes): 34
Address: 1310 Broadbill Way, San Diego Zip: 92038
Club: Top Billfish Club
Captain: Bill Fish Boat name: Good Grief
Address: 214 Tagright St. San Diego Zip: 92038
Response to this form is voluntary.
OMB 0648-0009, expiration date 03/31/01
NOAA 88-162, 7/98

ACKNOWLEDGEMENTS

The information reported here would not be possible without the cooperation of thousands of anglers and volunteers who support these investigations. Your efforts and assistance are greatly appreciated. We welcome reader comments and suggestions concerning the content of the *Billfish Newsletter*.

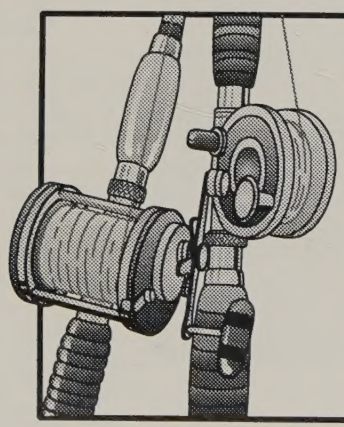
We thank the Los Angeles County Fish and Game Commission for their gift of 1,300 tag applicator pins for use with the new nylon tip tags. Thanks to Roy Allen and Henry Orr for the design and production of this newsletter.

SEND US YOUR PHOTOGRAPHS

The Southwest Fisheries Science Center is looking for good photographs of billfish for the cover of next years *Billfish Newsletter*. Color or black-and-white photos of billfish and/or fishing activities are appropriate. We would appreciate your sharing of photos and will give you full credit in the 1999 issue. A billfish baseball cap and plaque will be awarded to the winning photographer.

WEB SITE

The *Billfish Newsletter* can also be accessed on the Southwest Fisheries Science Center's home page under 'Publications' at http://swfsc.ucsd.edu.



Smooth seas and good fishing,

David B. Holts, Fishery Biologist
Douglas W. Prescott, Computer Specialist

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